Amendments to the Claims

The listing of claims will replace all prior versions, and listings of claims in the application.

1.   (Currently amended) An apparatus comprising:

a first buffer memory of a first type to store data associated with a connection identifier corresponding to a channel in a network, the data being organized into at least one chunk based on a linked list, the at least one chunk comprising at least one chunk data block, the connection identifier identifying a connection in the channel, the data being part of a data stream of a packet associated with the connection, the packet having a defined packet size; [[and]]

a packet memory of a second type coupled to the first buffer memory and configured to store [[a]] the at least one chunk data block ~~in response to a transfer condition, wherein the chunk data block includes a first data portion from a first chunk of the at least one chunk and a second data portion from a second chunk of the at least one chunk~~;

a second buffer memory of the first type coupled to the first buffer memory and the packet memory, and configured to store the at least one chunk data block; and

a write circuit (i) to write the at least one chunk data block to the packet memory in response to a transfer condition if the packet size indicates the packet is long, and (ii) to write the at least one chunk data block to the second buffer memory in response to the transfer condition if the packet size indicates the packet is short.

Atty. Dkt. No. 2222.4180001

Reply to Office Action of February 22, 2007

2.   (Currently amended) The apparatus of claim 1 further ~~comprises~~ comprising:

a descriptor memory to store descriptor information corresponding to the at least one chunk; and

a controller coupled to the descriptor memory and the first buffer memory to control data transfer between the first buffer memory and the packet memory using the descriptor information.

3.   (Currently amended) The apparatus of claim 2 wherein the at least one chunk further comprises:

a chunk header to store chunk information associated with the linked list~~; and~~

~~a chunk data block to store the data.~~

4.   (Original) The apparatus of claim 3 wherein the chunk information includes at least one of a pointer to point to one other chunk, a size specifier to specify size of the at least one chunk, and a type specifier to specify type of the at least one chunk.

5.   (Original) The apparatus of claim 4 wherein the at least one chunk is one of a head chunk corresponding to one end of the data stream, a linking chunk corresponding to an intermediate portion of the data stream, and a tail chunk corresponding to one other end of the data stream.

6.   (Original) The apparatus of claim 5 wherein the descriptor information includes

at least one of head and tail pointers, the head and tail pointers pointing to the head and

tail chunks, respectively.

7.   (Original) The apparatus of claim 6 wherein the connection identifier points to

one of the head and tail pointers.

8.   (Currently amended) The apparatus of claim 2 wherein the controller comprises:

an ingress queue to buffer the data stream of [[a]] the packet from an ingress of

the channel, the packet having a packet size; and

a queue segmenter to chunk the data stream into the at least one chunk.

9.   (Currently amended) The apparatus of claim 8 wherein the first buffer memory

comprises an input buffer memory to store the at least one chunk transferred from the

queue segmenter.

10.   (Original) The apparatus of claim 9 wherein the input buffer memory comprises

a queue associated with the connection identifier, the queue having a threshold and being

configured to store the at least one chunk.

11.   (Original) The apparatus of claim 10 wherein the transfer condition includes at

least one of an overflow of the threshold, the packet size, and a scheduled egress request.

Atty. Dkt. No. 2222.4180001

12.   (Currently amended) The apparatus of claim 11 wherein the controller further

comprises:

a data combiner to combine the chunk data ~~portion~~ block of one chunk with the

chunk data ~~portion~~ block of at least one other chunk in the input buffer memory; ~~and~~

wherein ~~a write circuit to burst write according to the scheduled egress request,~~

the write circuit ~~to burst write~~ (i) writes the combined chunk data ~~blocks~~ block to the

packet memory [[when]] if the packet size indicates [[that]] the packet is long, the

combined chunk data ~~blocks~~ block forming a contiguous data block in the packet

memory, and ~~the write circuit to write~~ (ii) writes the combined chunk data ~~blocks~~ block

to ~~an output~~ the second buffer memory ~~of the first type when~~ if the packet size indicates

[[that]] the packet is short.

13.   (Currently amended) The apparatus of claim 12 wherein the controller further

comprises:

a list creator to create an ordered list of pointers associated with [[the]] chunk

headers of the one and the at least one other chunk, the ordered list of pointers being

transferred to the ~~output~~ second buffer memory of the first type at a location pointed to

by [[the]] a head pointer;

a read circuit to burst transfer the contiguous data block from the packet memory

to the ~~output~~ second buffer memory using the ordered list of pointers in the ~~output~~

second buffer memory [[when]] if the packet size indicates [[that]] the packet is long;

and

an egress queue to buffer the contiguous data block transferred from the ~~output~~

second buffer memory.

14.   (Original) The apparatus of claim 13 wherein the first type is a static random

access memory and the second type is a synchronous dynamic random access memory.

15.   (Currently amended) The apparatus of claim 14 wherein the input buffer

memory and the ~~output~~ second buffer memory have same sizes.

16.   (Currently amended) The apparatus of claim 14 wherein the input buffer

memory and the ~~output~~ second buffer memory have different sizes.

17.   (Currently amended) A method comprising:

        storing data associated with a connection identifier corresponding to a channel in

a network in a first buffer memory of a first type, the data being organized into at least

one chunk based on a linked list, the at least one chunk comprising at least one chunk

data block, the connection identifier identifying a connection in the channel, the data

being part of a data stream of a packet associated with the connection, the packet having

a defined packet size; and

        ~~transferring a chunk data block from the buffer memory of the first type to a~~

~~packet memory of a second type in response to a transfer condition wherein the chunk~~

~~data block includes a first data portion from a first chunk of the at least one chunk and a~~

~~second data portion from a second chunk of the at least one chunk~~

- 7 -

Tam-Anh CHU
Appl. No. 09/668,407

Reply to Office Action of February 22, 2007

writing the at least one chunk data block (i) to a packet memory of a second type

in response to a transfer condition if the packet size indicates the packet is long and (ii)

to a second buffer memory of the first type in response to a transfer condition if the

packet size indicates the packet is short.

18.   (Currently amended) The method of claim 17 further comprises:

storing descriptor information corresponding to the at least one chunk in a

descriptor memory; and

controlling data transfer between the first buffer memory and the packet memory

using the descriptor information.

19.   (Currently amended) The method of claim 18 wherein storing the data

comprises:

storing chunk information associated with the linked list in a chunk header; and

~~storing the data in a chunk data block~~.

20.   (Previously presented) The method of claim 19 wherein the chunk information

includes at least one of a pointer to point to one other chunk, a size specifier to specify

size of the at least one chunk, and a type specifier to specify type of the at least one

chunk.

21.   (Previously presented) The method of claim 20 wherein the at least one chunk is

one of a head chunk corresponding to one end of the data stream, a linking chunk

corresponding to an intermediate portion of the data stream, and a tail chunk

corresponding to one other end of the data stream.

22.   (Previously presented) The method of claim 21 wherein the descriptor

information includes at least one of head and tail pointers, the head and tail pointers

pointing to the head and tail chunks, respectively.

23.   (Previously presented) The method of claim 22 wherein the connection identifier

points to one of the head and tail pointers.

24.   (Currently amended) The method of claim 18 wherein controlling the data

transfer comprises:

        buffering the data stream of [[a]] the packet from an ingress of the channel by an

ingress queue, the packet having a packet size; and

        segmenting the data stream into the at least one chunk.

25.   (Previously presented) The method of claim 24 wherein storing the data

comprises storing the at least one chunk transferred from the queue segmenter in an input

buffer memory.

26.   (Previously presented) The method of claim 25 wherein storing the at least one

chunk in the input buffer memory comprises storing the at least one chunk in a queue

associated with the connection identifier, the queue having a threshold.

- 9 -

Tam-Anh CHU
Appl. No. 09/668,407

Reply to Office Action of February 22, 2007

27.   (Previously presented) The method of claim 26 wherein the transfer condition includes at least one of an overflow of the threshold, the packet size, and a scheduled egress request.

28.   (Currently amended) The method of claim 27 wherein controlling the data transfer further comprises:

combining the chunk data block of one chunk with the chunk data block of at least one other chunk in the input buffer memory;

~~burst writing, according to the scheduled egress request, the combined data portions to the packet memory when the packet size indicates that the packet is long, the combined chunk data blocks forming a contiguous data block in the packet memory; and~~

~~writing, according to the scheduled egress request, the combined chunk data blocks to an output buffer memory of the first type when the packet size indicates that the packet is short.~~

29.   (Currently amended) The method of claim 28 wherein controlling the data transfer further comprises:

creating an ordered list of pointers associated with the chunk headers of the one and the at least one other chunk, the ordered list of pointers being transferred to the ~~output~~ second buffer memory of the first type at a location pointed to by the head pointer;

burst transferring [[the]] a contiguous data block from the packet memory to the

~~output~~ second buffer memory using the ordered list of pointers in the ~~output~~ second

buffer memory when the packet size indicates [[that]] the packet is long; and

buffering the contiguous data block transferred from the ~~output~~ second buffer

memory in an egress queue.

30.   (Original) The method of claim 29 wherein the first type is a static random

access memory and the second type is a synchronous dynamic random access memory.

31.   (Currently amended) The method of claim 29 wherein the input buffer memory

and the ~~output~~ second buffer memory have same sizes.

32.   (Currently amended) The method of claim 29 wherein the input buffer memory

and the ~~output~~ second buffer memory have different sizes.

33.   (Currently amended) A system comprising:

a channel in a network having an ingress and egress;

a data buffer circuit coupled to the channel to buffer data transmitted over the

channel, the data buffer circuit comprising:

an input buffer memory of a first type to store data associated with a connection

identifier corresponding to the channel, the data being organized into at least one chunk

based on a linked list, the at least one chunk comprising at least one chunk data block,

the connection identifier identifying a connection in the channel, the data being part of a

data stream <u>of a packet</u> associated with the connection<u>, the packet having a defined</u>

<u>packet size,</u>

an output buffer memory of the first type to store the data transferred from the

input buffer memory, and

a packet memory of a second type coupled to the input and output buffer

memories ~~and configured to store a chunk data block in response to a transfer condition,~~

~~wherein the chunk data block includes a first data portion from a first chunk of the at~~

~~least one chunk and a second data portion from a second chunk of the at least one chunk;~~

<u>and</u>

<u>a write circuit (i) to write the at least one chunk data block to the packet memory</u>

<u>in response to a transfer condition if the packet size indicates the packet is long, and (ii)</u>

<u>to write the at least one chunk data block to the output buffer memory in response to the</u>

<u>transfer condition if the packet size indicates the packet is short.</u>

34.   (Previously presented) The system of claim 33 wherein the data buffer circuit

further comprises:

a descriptor memory to store descriptor information corresponding to the at least

one chunk; and

a controller coupled to the descriptor memory and the input and output buffer

memories to control data transfer between the buffer memories and the packet memory

using the descriptor information.

- 12 -

Tam-Anh CHU
Appl. No. 09/668,407

Reply to Office Action of February 22, 2007

35.   (Currently amended) The system of claim 34 wherein the at least one chunk

further comprises:

        a chunk header to store chunk information associated with the linked list; and

        a chunk data block to store the data.

36.   (Original) The system of claim 35 wherein the chunk information includes at

least one of a pointer to point to one other chunk, a size specifier to specify size of the at

least one chunk, and a type specifier to specify type of the at least one chunk.

37.   (Original) The system of claim 36 wherein the at least one chunk is one of a head

chunk corresponding to one end of the data stream, a linking chunk corresponding to an

intermediate portion of the data stream, and a tail chunk corresponding to one other end

of the data stream.

38.   (Original) The system of claim 37 wherein the descriptor information includes at

least one of head and tail pointers, the head and tail pointers pointing to the head and tail

chunks, respectively.

39.   (Original) The system of claim 38 wherein the connection identifier points to one

of the head and tail pointers.

40.   (Currently amended) The system of claim 34 wherein the controller comprises:

an ingress queue to buffer the data stream of [[a]] the packet from the ingress of

the channel, the packet having a packet size; and

a queue segmenter to chunk the data stream into the at least one chunk.

41.   (Original) The system of claim 40 wherein the input buffer memory stores the at

least one chunk transferred from the queue segmenter.

42.   (Original) The system of claim 41 wherein the input buffer memory comprises a

queue associated with the connection identifier, the queue having a threshold and being

configured to store the at least one chunk.

43.   (Original) The system of claim 34 wherein the transfer condition includes at least

one of an overflow of the threshold, the packet size, and a scheduled egress request.

44.   (Currently amended) The system of claim 43 wherein the controller further

comprises:

a data combiner to combined the chunk data portion block of one chunk with the

chunk data portion block of at least one other chunk in the input buffer memory; and

wherein a write circuit to burst write according to the scheduled egress request,

the write circuit to burst write (i) writes the combined chunk data blocks block to the

packet memory [[when]] if the packet size indicates [[that]] the packet is long, the

combined chunk data blocks block forming a contiguous data block in the packet

memory, and (ii) the write circuit to write writes the combined chunk data blocks block

to the output buffer memory [[when]] if the packet size indicates [[that]] the packet is

short.

45.   (Currently amended) The system of claim 42 wherein the controller further

comprises:

        a list creator to create an ordered list of pointers associated with [[the]] chunk

headers of the one and the at least one other chunk, the ordered list of pointers being

transferred to the output buffer memory of the first type at a location pointed to by [[the]]

a head pointer;

        a read circuit to burst transfer the contiguous data block from the packet memory

to the output buffer memory using the ordered list of pointers in the output buffer

memory [[when]] if the packet size indicates [[that]] the packet is long; and

        an egress queue to buffer the contiguous data block transferred from the output

buffer memory.

46.   (Previously presented) The system of claim 45 wherein the input buffer memory

and the output buffer memory have same sizes.

47.   (Previously presented) The system of claim 45 wherein the input buffer memory

and the output buffer memory have different sizes.

48.   (Original) The system of claim 45 wherein the first type is a static random access memory and the second type is a synchronous dynamic random access memory.